

COAST GUARD

OFFICE OF RESEARCH & DEVELOPMENT

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BIBLIOGRAPHY OF MARITIME SEARCH THEORY

AND

BACKGROUND MATERIAL ON OPERATIONS RESEARCH

BY

VIRGIL L. BANOWETZ LTJG, USCGR

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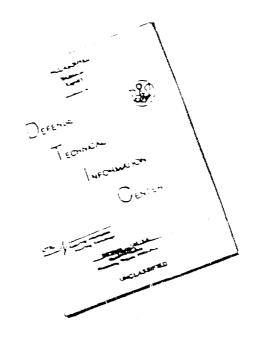
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UNITED STATES COAST GUARD APPLIED TECHNOLOGY DIVISION

BIBLIOGRAPHY OF

MARITIME SEARCH THEORY

AND BACKGROUND MATERIAL ON OPERATIONS RESEARCH

BY

VIRGIL L. BANOWETZ LTJG, USCGR

Dete:

Submitted

G. T. SEAMAN, CDR, USCG

Chief, Search and Rescue Branch

Approved:

J. R. IVERSEN, CAPT, USCG

Chief, Applied Technology Division Office of Research and Development U. S. Coast Guard Headquarters

Washington, D.C. 20591

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ABSTRACT

The items in this bibliography relate, in various degrees, to the operations research of planning a maritime search. The list is neither exhaustive nor very centrally related. Some of the references have been studied at this office. Limited assistance may be requested here for obtaining most of them. There is no order to the list but an alphabetical list by author referring to the item number is included. Additions and corrections are requested. This and requests for updated versions of the paper may be sent to:

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U. S. Coast Guard Headquarters
400 7th Street, S.W.
Washington, D. C. 20591

Phone: (202) 426-1013

ABBREVIATIONS USED IN THIS WORK

OR - Journal of Operations Research Society of America

Nav Res Log Quart - Naval Research Logistics Quarterly

S - Secret Item

C - Confidential Item

Man Sci - Management Science

USCGA - US Coast Guard Academy

OEG - Operations Evaluation Group of Office of Chief of Naval Operations

OPS - Operations

OPS R - Operations Research

SAR - Search and Rescue

FNWC - Fleet Numerical Weather Center

CNO - Chief of Naval Operations

OSR - Operations, Search and Rescue, division of USCG Headquarters, Washington, D.C.

USAF- United States Air Force

AFB- Air Force Base

1. Methods of Operations Research (1951)

Horse, P. and Kimball, G., OEG-54

- 2. Articles in OR by Koopman, B. O.:
 - a. "Introduction to Operations Research," 1:1 (1952) pp 3-9.
 - b. "Optimum Distribution Effort," 1:2 (1953) pp 52-63.
 - c. "The Theory of Search: Part I, Kinematic Bases:, 4:3 (56) pp 324-346.
 - d. "The Theory of Search: Part II, Target Detection," 4:5 (56) pp 503-531.
 - e. "The Theory of Search: Parc III, The Optimal Distribution of Searching Effort," 5:5 pp 613-626.
- 3. "Selected Search Problems and Techniques," (1967)

Van Courte Hare, Jr.; Systems Analysis: A Diagnostic Approach pp 259-317.

4. "Optimum Dist of Effort: An Extension of the Koopman Basic Theory,"

De Gueninm Jacques, OR 9:1 (1961) pp 1-7..

- 5. "The Distribution of Radical Error and its Statistical Application in War Gaming" Edmundson, H. P. OR 9:1 (1961) pp 8-21.
- 6. "An Allacation Problem with Applications to Ops R Statistics" Zahl, Donald F., OR 9:6 ('61) pp 907-908.
- 7. "Information Theory and Search Theory as special Cases of Decision Theory" Mela, Donald F., OR 9:6 ('61) pp 907-908.
- 8. "A Survey of Search Theory," OR 16:3, ('68) pp 525-531. Dobbie, James M.
- 9. "A Bibliography of Search Theory and Reconnaissance Theory Lit" Enslow, P. H. Naval Res Log Quart 13,177-202 ('66).
- 10. "The Measurement of Information" Memorandum for Dir OEG, Koopman, B. O., (5 Dec '52).
- 11. "The Theory of Search: Optimal Distribution of Searching Effort" Charnes, A., and Copper, W. W., Man Sci 5:1 ('50) pp 44-50.
- 12. "Search Theory: A Sequential Approach"

 Dobbie, J. M., Nav Res Log Quart 10:323-334 ('63)
- 13. "On Koopman's Addition Theorem in Search Theory"
 Danskin, John M., Institute of Naval Studies, Cambridge, Mass ('64).

- 14. "Some Problems in Search Theory,"

 Dobbie, James M. (To be published in Nav Res Log Quarterly after June 68).
- 15. "Sector Search, A Replacement for the Expanding Square," USCGA Waters, J. M., CDR, USCG; USCGA Alumni Assn Bulletin, (Nov 60).
- 16. "Optimum Planning and Utilization in Search Ops,"
 Waters, J. M., CDR, USCG; <u>USCGA Alumni Assn Bulletin</u>, March 61).
- 17. "Visual Detection of Targets Analysis and Review"
 Ronald Erickson U. S. Naval Ordance Test Section China Lake, Calif. (Feb 65)AD 612721 (Nav Weps Rept 8617).
- 18. "Problem of Visual Research in Rescue Operations"
 Waters, J. M., Jr., CDR, USCG Paper for Visual Research Symposeum (15 May 62).
- 19 . "A Review of Search and Reconnaissance Theory Literature"

Moore, Michael L., University of Michigan, Ann Arbor, Systems Research Lab

(Jan '70), Rept no. SRL -2147 - TR - 70

20. "Search Problems and Information Theory" (5 June '61)

Novosad R. S., Martin Co., Denber Div - Operations Research Dept, Working Paper #64.

21. "An Optimal Search Pattern"

Isbell, J. R. Nav Res Log Quart 4:4 pp 357-359 (Dec '57)

22. "An Alternative Solution to the Lost Sea Problem"

Glass, Brian, Nav Res Log Quart 8, pp 117-121 (1961 b).

23. "Optimal Persistence Policies" OR 8:3 pp 362-389 (May-Jun 69)

Mac Queen, J. and Miller, R. G.

24. "Emperical Sweep Width Analysis (Air to Surface)"

Richardson, William Hadley - 510 Ref 68-30, Oct 68

Scripps Institute, Visibility Lab, Univ of Calif. San Diego, Calif.

25. "Navigational Accuracy and Probability of Detection of Search Targets"

McCullough, A. J., CDR, (Ret), USCGA Alumni Assn Bulletin.

26 . "Search and Information Theory" - Part of Final Report on

Stochastic Processes In Certain Naval Operations

Koopman, B. O., Nov 67, AD 687-534, Columbia University.

27. "Optimum Search for Objects Having Unknown Arrival Times"

Blackman, Nelson - OR 7:5 (Sept - Oct 59).

28. "An Optimal Redundancy"

Black, Guy; OR 7:5 (Sept - Oct 59) (Has only anologous relationship to search).

29. "Methods and Devices for Locating Small Distressed Submersibles" - (Feb 70)
Lockheed-Missiles and Space Co., Sunnyvale, Calif.

30 . "Computerized Survivor Search Planning"

Discenza, Joseph H., LCDR, USCG, Navy Postgraduate School, Monterey (1962)

31 . "Computer Applications to The SAR Problem"

Cohan, M. C. and Offutt, J. R.; USCGA, New London, Conn. (20 May 65).

32. "A Computerized Method of Optimizing the Locations of Inshore Search and Rescue Units"

Withers, D. H., LT, USCG. (18 April 66)

33 . "Synoptic Analysis and Forecasting of Surface Currents"

Hubert, W. E., CDR, USN and Laevastu, T. (June 65), FNWC Monterey.

34 . "Computer Program of USCG SAR Procedures Determination of Search Area"

Armacost, R. L., and Saunders, N. T., USCGA, New London, Conn (19 May 64)

35 . "Oceanographic Data Collection", Tech not No. 32

Wolff, Paul M. CAPT, USN, FNWF, Monterey, Calif (April '67).

36 . "A Study of Shallow Water Wind Drift Currents at Two Station Off the East Coast of the U. S."

Doebler, Harold, U. S. Navy Underwater Sound Lab, New London, Conn (13 May '66)

- 37. "Applied Dynamic Programming"
- Bellman, Richard E. and Dreyfus, S. E., Rand Corporation, Santa Monica Calif. (May 62).
- 38. "The Optimum Selection of Search and Rescue Units by Computer" Hewitt, W. B., LCDR, USCG, Univ. of Conn (1968).
- 39. "Methods for Locating Survivors Adrift at Sea on Rubber Rafts" Hydrographic Office, Pub No. 235 (Nov 44).
- 40. "The Effect of Computed Drift on Search Planning"

Weis, R. B. LCDR, USCG, Letter to OSR (29 June '67)

41. "Development of a Computer Program for Determination of Search Area for SAR Operations of the USCG"

Cunningham and Frantz; USN Postgraduate School, Monterey, Calif (1965).

42. "A Statistical Rose Program"

Yergen, Walter E., Evaluation Branch, Oceanographic Analysis Division, Marine Sciences Dept., U. S. Naval Oceanographic Offices, Wash., D. C. (Oct 62).

43. "A Standard-Vector Deviation Rose Program for Current Data"

Burns, Donald A., Marine Sciences Dept., U. S. Naval Oceanographic Office, Washington, D. C. (Aug 65)

44. "Statistics for Scientists and Engineers"- p 91

Wine, R. L., Prentice-Hall, Inc., Englewood, Cliff, N. J., (1964).

45. "An Introduction to the Theory of Statistics"

Jule, G. U. and Kendall, M. G. (1950) Charles Griffin and Co., LTD., London.

46. "Antisubmarine Warfare in World War II" (OEG-51)

Sternhell, C. M. and Thorndike, A. M., Office of CNO, Wash., D. C. (1946)

47. "Search and Screening" (OEG-56)

Koopman, B. O., Office of CNO, Wash., D. C. (1946)

48. "Ocean Thermal Structure Forecasting"

James, R. W. (1966) Asweps Manual Vol 5 (SP-105)

U. S. Naval Oceanographic Office, Wash., D. C.

49. Treatment of Experimental Data

Worthing, A. G. and Geffner, J., John Wiley and Sons, New York (1943).

50. "The Mathematics of Search and Rescue"

Brooks, Richard, CDR, USCG (March 68).

51. Search Detection and Reconnaissance Bibliography,

Pollock, Steve M., Naval Postgraduate School. (Dec 67:-Submitted Jan 69).

52. <u>Influence of System Parameters on Optical Tactics and Effectiveness</u>

in <u>Deep Submergence Search</u>

Stone, Lawrence D., Wagner Associates (May 68).

- 53. <u>Search in the Presence of False Targets Which May be Identified</u>
 Persinger, C. A., Wagner Associates (15 May 70).
- 54. Manual For Deep Ocean Search

Richardson, Henry R. and Stone, L. D., Wagner Associates (17 Dec 69).

55. Operational Analysis During The Underwater Search For Scorpion Richardson, Henry R. and Stone, L. D., Wagner Associates (5 May 70).

56.C. Review of C-2A Tankin Gulf Search

Richardson, Henry R., and Stone, L. D., Wagner Associates, (11 Mar 70).

57.S. Report Bibliography on Search Theory, 14 May 70

Defense Documentation Center (Requested by Virgil Banowetz)

58. Amver Computer Replacement Study Part II, Sept 67

Eastern Area, USCG

59.C "A Relation Between the Average Range of Direct Approach and Sweep Widt' Fine, Nathan J. and Lamb, Frank W., OEG, Office of CNO, Wash., D. C., OEG Study No. 325, 14 pp (24 June 47).

- 60: "Proposal Concerning a Technique Of Optimizing Search Patterno" Hinkle, Richard J., LCDR, USCG, USCGA, (April 1968)
- 61. National Search and Rescue Manual (FM-150; NWP-37(A); AFM 614-2; CG-308)
 United States Coast Guard
- 62. "Field Study Of Detectability Of Colored Targets At Sea"

 Human Engineering Branch, Bureau of Medicine & Surgery, Navy Department,

 Project NM 002 014.09.03, Report No. 265, AD 74708 (26 May 1955)
- 63. "Calculus of Variations and Operations Research", AD254107

 Danskin, John M., Aeronautical Research Leb, Air Force Research Division,

 Air Research and Development Branch, USAF, Wright Patterson AFB, Ohio (Dec 1960)

ALPHARKTICAL LINT

Author/Kditor	Item number
Armacout & Saunders	34
Bellman & Dreyfus	37
Black	2.6
Blachman	27
Brooks	50
Burns	43
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